INNCON SOFTWARE

Business Graphics

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BUSINESS GRAPHICS
VERSION A2.0
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USER MANUAL

USING INNCON SOFTWARE GRAPHICS

To begin using any of the software packages, place the INNCON Software program disk in disk drive 1 (drive A) and follow the instructions for your personal computer for booting the disk. The command for most Apple computers is PR#6.

The first menu displayed is the system menu. It allows you to run your INNCON software packages. In addition, this menu contains three other options:

⟨S⟩AVE HI-RES PLOT PROGRAM
⟨P⟩RINT HI-RES SCREEN
⟨B⟩OOT A DISK

This initial menu shall be refered to as the system menu throughout the INNCON documentation.

HI-RES PLOT PROGRAM OPTION

This option lets you save a program entitled "HI-RES PLOTTER" to one of your own DOS 3.3 disks. Running the HI-RES PLOTTER program allows you to load a chart, graph, or sign previously saved to disk by an INNCON Software program and display it on the hi-res screen. In addition, once a chart, graph, or sign is loaded, you can use your own software to dump hi-res page two to your printer and create a hard copy (paper copy) of the binary file containing the chart, graph, or sign to be displayed, after which, the hi-res page will be loaded and displayed. Striking any key will return you to the text mode, however, the hi-res page will remain intact. You may then perform the steps necessary to dump hi-res page 2 to your printer if you so desire.

A printing option is also available, which will print the hi-res screen. The software needed to print the hi-resolution graphics screen for the Apple computer is very complicated. If apple basic was used it would take approximately 15 minutes to print the screen. Thus, we have used a machine language program to print the screen. The code used to do this is available in the SAVE HI-RES PLOT program for your modification. The routine we use to print the hi-res screen may need to be modified depending on the type of printer interface card and printer you have in your computer system.

The program provided will print hi-res page 2 on Epson printer using a Epson printer interface card.

BOOT A DISK OPTION

This option allows you to boot a disk in drive 1. Other than shutting off the power, this is the only means available for exiting the INNCON Software package.

INTRODUCTION

The Business Graphics package is a versatile home and business tool for creating colorful bar charts, line graphs, and pie charts. The programs are menu driven and easy to operate. When choosing an option from the menus displayed in the Business Graphics package, enter the character between the " 〈 " and " 〉 ".

RUNNING THE BUSINESS GRAPHICS PACKAGE

The first screen displayed by the Busness Graphics (BG) program is INNCON Software banner. The first instruction is "enter any key to continue." Enter any key to continue. Upon continuing the program, the next screen displayed is the BG menu. This menu lists 5 options. These options are:

〈1〉 EDIT OR CREATE NEW DATA
〈2〉 PIE CHART
〈3〉 BAR CHART OR LINE GRAPH
〈4〉 DISK OPTION MENU
〈5〉 RETURN TO SYSTEM MENU

The above menu is referred to as the main menu throughout this user manual. The following descriptions of options 1 through 5 describe in detail the commands available under each option. A bar-chart/line-graph tutorial and pie-chart tutorial is presented at the end of the manual to guide the user through the terminology and format used in our Business Graphics software.

OPTION 1 ⟨1⟩ EDIT OR CREATE NEW DATA

To exercise this option, enter a "1." The screen will then clear and a program will be loaded from the INNCON Software disk. The INNCON Software graphics disk must remain in disk drive 1.

The next screen displayed is the data editor of the BG package. Several options are available in the data editing mode.

The first entry concerns clearing the screen of data. If data is present in the 5 columns on the screen, it may be erased by entering a "Y" representing yes to the "NEW DATA?" question. To start entering data, a "Y" or "N" should be entered. An "N" does not clear the data.

Control characters are used to control most of the functions in the data editor. A summary of the commands is listed below:

CTRL-L Legend editor
CTRL-X X-field builder
CTRL-Q Quit data editor, return to main menu
CTRL-N New data. Clears the data editor
CTRL-I Move cursor up one row
CTRL-J Move cursor left one column
CTRL-K Move cursor right one column
CTRL-M Move cursor down one row

CTRL-I,J,K,M commands simply move the cursor on the screen to allow entry of data in any row or column. CTRL-L is the legend editor. After entering a CTRL-L, each of the 4 legends is entered. The legends are displayed above columns 2 through 5 on the monitor after entry. CTRL-X enters the x-field editor. The x-field builder allows easy entry of months, days, or numbers for the x-axis (first column on the screen) on the chart. This option is menu driven and has the following options:

⟨1⟩ MONTHS
⟨2⟩ DAYS
⟨3⟩ NUMBERS
⟨4⟩ EXIT

To use any of these options, enter the number corresponding to the option desired. The x field builder will save you some typing if you want the x axis labels to be months, days, or a range of numbers. CTRL-Q exits the data editor and returns program control to the main menu. When a CTRL-Q is entered, a question appears asking "RETURN TO MENU?" A "Y" should be entered to return to the main menu, a bar chart, line graph or pie chart may be selected only after data has been entered.

OPTION 2 〈2〉 PIE CHART

To exercise this option, enter a "2." The screen will clear and a program will be loaded from the INNCON Software disk. Keep the INNCON Software disk in disk drive 1. The next screen displayed defines the pie chart parameters. Instructions for the commands appear on the screen and should be followed to set the pie chart parameters. Depending on the type of pie chart desired, the parameters on the screen may be varied.

The first parameter determines how many columns to read as labels. The data editor only allows column widths of eight characters. If you want the pie chart to have longer labels, put the labels in the first two columns of the data screen and enter a "2" for the value of this parameter. Then you can have labels as long as 16 characters.

The second parameter determines which column to graph. Pie charts are one-dimensional, so you can only graph one of the four data columns at a time. If you put legends at the top of the columns, they will appear at the top of the parameter screen to remind you which columns contain particular data.

The third parameter determines whether, and how, you want the data sorted. Sorting the data by valves produces nice, orderly pie charts. Sorting alphabetically by label may also be appealing. If you choose not to sort, the data will be plotted and labeled in the order it was entered.

The fourth parameter determines if a color or black and white pie chart is to be plotted. If you have a color monitor, a color pie chart looks much nicer than a black and white one. However, a black and white pie chart will look better when printed.

The fifth parameter determines if you want the pie chart plotted upright or on its side. If you plot it upright it will appear onscreen with the pie on the left, labels on the right, and the legend at the top. If you put the chart on its side, the pie will still be on the left and the labels on the right, but the labels will run from bottom to top and the legend will run up the left side. This looks somewhat strange on the monitor but will produce the desired result when printed.

The rotation parameter determines where on the circle the plotting begins. This option is most useful on color pies, where some colors

don't go well next to each other. Rotating the pie can sometimes alleviate the problem.

A CTRL-P processes the pie chart. Once the chart appears on the screen any key entry will return the screen to text mode and ask for the next instruction. If the pie chart parameters were not properly set before the pie chart was drawn on the screen they may now be reset. The following menu lists the options:

⟨1⟩ RETURN TO MENU
⟨2⟩ VIEW CHART
⟨3⟩ REDEFINE NEW PARAMETERS

To redefine new pie chart parameters a "3" is entered. To return to the main menu a "1" is entered and to view the pie chart again a "2" is entered.

OPTION 3 ⟨3⟩ BAR CHART OR LINE GRAPH

To exercise this option, enter a "3." The screen will clear and the bar chart/line graph will clear and the bar chart/line graph program will be loaded from the INNCON Software disk located in drive 1. The commands used to define the bar chart and line graph are displayed at the bottom of the screen. The commands are L,B,E,T,Y,C,G, CTRL-P and CTRL-Q.

L Set chart type
B Beginning label for graph
E End label for graph
T Chart title
Y Y axis range
C Color or black and white
G Grid density
CTRL-Q Quit to menu
CTRL-P Process chart

The L command allows you to set the type of chart, bar or line, for each of the columns of data. Because chart types are assigned individually for each column of data, you can determine what to graph and what not to.

The B and E commands work as a pair, allowing you to set the beginning and end labels for the graph. In other words, if you have data ranging from February to November you may set the range anywhere between the two.

The T command allows you to enter a chart title. You may want to change the title each time a new graph is drawn.

The Y command allows you to set the range on the y axis. You must enter a number for low Y that is less than or equal to the least value displayed on the left, and assign a high Y value that is greater than or equal to the largest value also displayed on the left. The increment must be large enough for the labels to fit on the graph.

The C command is a toggle for setting color or black and white. The G command sets the grid density, and the CTRL-Q command will return you to the main menu. A CTRL-P will process the chart, using the parameters that you have defined.

After the chart is processed by CTRL-P, the parameters may be re-defined using the menu which appears after the chart is created. This option allows you to correct parameter errors or reshape the chart.

OPTION 4 〈4〉 DISK OPTION MENU

There are 7 options available in the disk option menu. They are as follows:

〈1〉 Load a data file from a disk
〈2〉 Save a data file on disk
〈3〉 Load a chart from a disk
〈4〉 Save a chart on disk
〈5〉 Display the graphics screen
〈6〉 Catalog a disk
〈7〉 Return to main menu

The first two options are for saving data entered by the data editor. The third and fourth options save and load a graph to and from a disk. If a chart has been created it can be saved and later reloaded with these options. The fifth option displays the graphics screen. This allows you to re-examine the chart that you have created. The sixth option will catalog a disk (list the filenames contained on the disk). The seventh option returns you to the main menu.

OPTION 5 〈5〉 RETURN TO SYSTEM MENU

To end the graphing session enter a "5." This will exit you from the Business Graphics package and return you to the system menu encountered when the HELLO.BAS program was run.

CREATING A BAR CHART/LINE GRAPH OR PIE CHART

To begin, enter the business Graphics program by selecting the Business Graphics package option from the system menu. This option is chosen by entering a "1." The next screen displayed is the Business Graphics banner and the instruction "ENTER ANY KEY TO CONTINUE" is displayed. Enter any key to continue.

The next screen display is the Business Graphics Menu. The first step in creating a bar chart/line graph or pie chart is data entry. The data for the chart must be entered before the chart may be drawn. To enter the data needed for the chart, select the "EDIT OR CREATE NEW DATA" option from the Business Graphics menu. This will run the data editing program.

The screen is partioned into five columns in the data editor. The first column is the x axis, or horizontal axis on the chart. The CTRL-X option in the data editor will allow you to enter months, days, or numbers for the x axis (the x axis is refered to as the x-field in the user manual). This option may save you some typing. To enter JAN, FEB, and MAR in the first column enter a CTRL-X. Choose the months option, select 3 months starting with month #1. The screen will then display the first three months in column one. When creating a pie chart this column contains the labels for each slice in the pie.

The Business Graphics program allows you to plot four sets of data at a time, provided they use the same values on the x axis. Columns 2 through 5 on the screen are for the numerical values to be plotted. They are eighteen rows in each column. To enter data in these columns, simply position the cursor in the column using the CTRL-I,J,K,M commands and type in the value. When you enter a number and a carriage return (the "RETURN" key), the cursor will position itself on the next row below the data entered.

The top two rows above columns 2 through 5 are for the labels used to describe the data contained in the column. When creating a pie chart this label is printed at the top of the pie chart, and when creating a bar chart/line graph the label is printed below the x axis. The labels (legends) are entered by entering a CTRL-L.

As soon as data, legends, and x axis information is entered a chart may be created. Both the bar chart/line graph program and pie chart program use the data entered in the data editor. If you are satisfied with the data entered as displayed on the screen, enter a CTRL-Q to quit the data editor and return to the Business Graphics menu.

To create a bar chart, select the bar chart/line graph option from the Business Graphics menu. Enter in the bar chart parameters using the commands listed under option 3 of the user manual. You may wish to experiment with these parameters to better understand their uses. When you feel the parameters are set properly, enter a CTRL-P to process the chart. You may always return and reset the parameters after the chart is drawn if you feel they need changing.

To create a pie chart, select the pie chart option from the Business Graphics menu. Set the pie chart parameters as described under option 2 of the user manual. These parameters may be reset following each pie chart displayed. Experimenting with these parameters will allow you to produce the type of pie chart that you desire.

A BAR CHART/LINE GRAPH TUTORIAL

To begin, select the Business Graphics option from the system menu. The INNCON Technologies banner will appear and the instruction to enter any key will be displayed. Enter any key to continue. In doing so the Business Graphics menu will be displayed. To begin, select option ⟨1⟩ , the "EDIT OR CREATE NEW DATA" option.

The screen will clear and the data editor will appear on the screen. In our example, we have data for months January through May. We may use the CTRL-X option in the data editor to enter the months. The first entry is CTRL-X to enter the x-field builder. After entering a CTRL-X the following menu will appear.

— X AXIS —

⟨1⟩ MONTHS
⟨2⟩ DAYS
⟨3⟩ RANGE OF NUMBERS
⟨4⟩ EXIT

ENTER CHOICE ⟶

Since we desire months, enter a "1." The screen will clear and the following questions will appear.

NUMBER OF MONTHS? 5
STARTING WITH MONTH #? 1

We have data for 5 months, January through May, and we will start with month #1 (January). After entering "5" for the number of months and "1" for the starting month, the screen returns to the data editor with the cursor located in the first row of column 1 next to the "N" in "JAN." The first column on the data editor contains the x-field, or x axis, labels. The adjacent 4 columns are for numerical data. To begin entering the first column of numerical data, enter a CTRL-K to move the cursor to the next column. Enter the number 10 and then CR (this stands for carriage return). A CR will move the cursor down to the next row in column 2. Next, enter the number 20 and a CR for FEB. Enter 30,40 and 50 for months MAR, APR, and MAY.

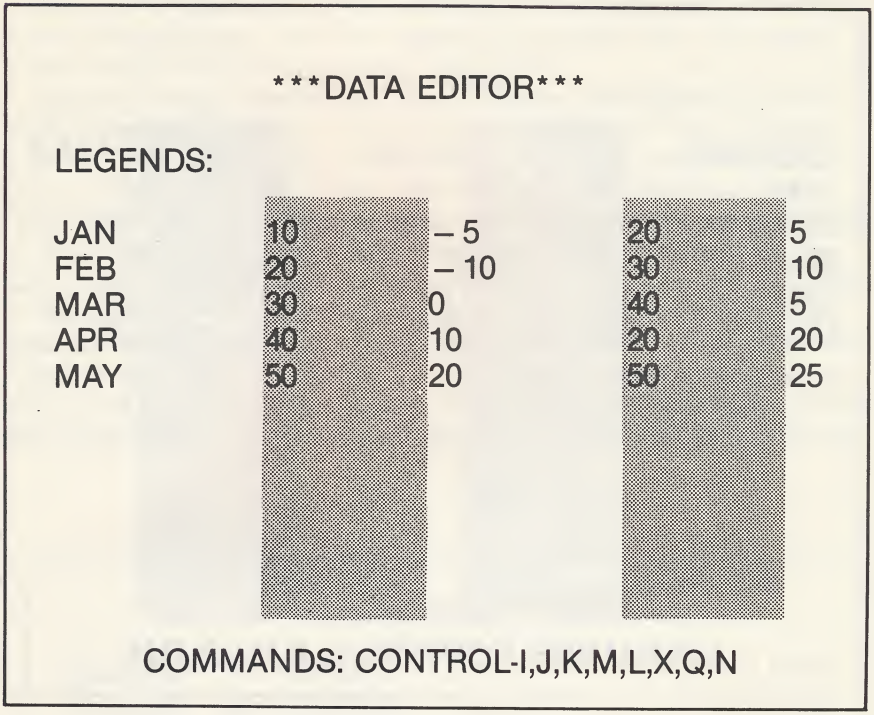


FIGURE 1

The data we are entering is shown in Figure 1. After entering the number 50 in the first column of data, move the cursor to the next column, column 3 on the screen, with a CTRL-K. The cursor will be located across from the month of MAY in this column. To move the cursor to the top of the column, enter a CTRL-I 4 times to move the cursor up to JAN. Once the cursor is positioned in the first row, enter the data for this column as shown in Figure 1 (– 5, – 10,0,10,20). Similarly, move the cursor to the next column with another CTRL-K, move the cursor to the top of the column, and enter the data for this column (20,30,40,20,50). Next, move the cursor to the last column, and enter the data (5,10,5,20,25). When finished, the screen should appear as in Figure 1.

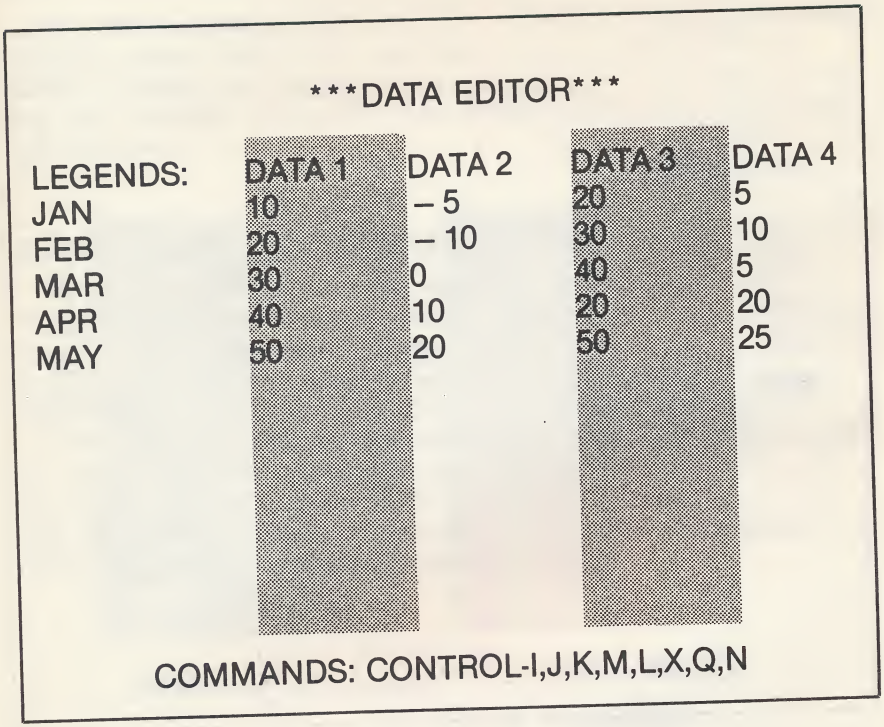


FIGURE 2

The entry of the x-field and numerical data for our example is finished. The data in columns 2 through 5 need to be labeled. To label the data we will use the legend editor. Enter a CTRL-L and the instruction to enter Legend 1 will appear at the bottom of the data editor. Enter "DATA 1" for Legend 1 and then a CR. When a CR is entered, the instruction to enter Legend 2 is displayed. Enter "DATA 2" for legend 2 and then a CR. Similarly, repeat this for "DATA 3" and "DATA 4." When the legends have been entered the data editor should display the same information shown in Figure 2.

We are now finished with the data editor. All of the numerical data has been entered in columns 2-5, the x-field in column 1, and the legends describing the data at the tops of the columns. If we wished to erase all the contents in the data editor, we could enter a CTRL-N for new data. Do not do this now so we may continue creating our example bar chart.

To exit the data editor, enter a CTRL-Q. The next screen should display the Business Graphics menu. Enter option 〈2〉 to create a bar chart/line graph.

Entering the Bar Chart/Line Graph program will display the information shown in Figure 3. We will begin creating the bar chart/line graph by entering the y axis parameters. The y axis parameters are used to scale the y axis. Enter a "Y" to begin entering the y axis parameters. The least data value and largest data value are displayed on the screen so that the scales can be selected to include all the data points. The least data value and largest data value are displayed on the screen so that the scales can be selected to include all the data points. The least value for the data entered is – 10 as shown in Figure 3. We begin by entering a – 20 for low y. Then enter a 60 for high y and a 20 for the increment. These values will set the bottom of the y axis at – 20, and increment the y axis by 20 until 60 is reached.

```
                BAR CHART/LINE GRAPH GENERATOR

LEGEND  1 : DATA 1                              – LINE
LEGEND  2 : DATA 2                              – LINE
LEGEND  3 : DATA 3                              – LINE
LEGEND  4 : DATA 4                              – LINE

〈                 〉

J F M A M
A E A P A
N B R R Y


TITLE:
LEAST VALUE:   – 10                        Low Y:   0
MOST VALUE:    50                          HIGH Y:  0
COLOR:   YES                           Y INCREMENT: 0
GIRD DENSITY:   4

          COMMANDS: L,B,E,T,Y,C,G CONTROL-P,Q
```

FIGURE 3

To enter a chart title enter a "T." The screen will display the information shown in Figure 4, and we will enter the chart title "CHART OF DATA."

```
                BAR CHART/LINE GRAPH GENERATOR

LEGEND  1 : DATA 1                              – LINE
LEGEND  2 : DATA 2                              – LINE
LEGEND  3 : DATA 3                              – LINE
LEGEND  4 : DATA 4                              – LINE

〈                 〉

J F M A M
A E A P A
N B R R Y


TITLE: CHART OF DATA
LEAST VALUE: – 10                          LOW Y:  – 20
MOST VALUE:  50                           HIGH Y:  60
COLOR: YES                          Y INCREMENT:  20
GRID DENSITY:   4

ENTER CHART TITLE
```

FIGURE 4

The chart we are creating will be made in the black and white mode. To toggle the color option enter a "C." This will toggle the color option between "yes" and "no."

The grid density controls the darkness of the grid lines on the chart. To change the grid density enter a "G." We will choose a grid density of 2. You may wish to experiment with this parameter for best results. After entering a 2 the screen should display the information shown in Figure 5.

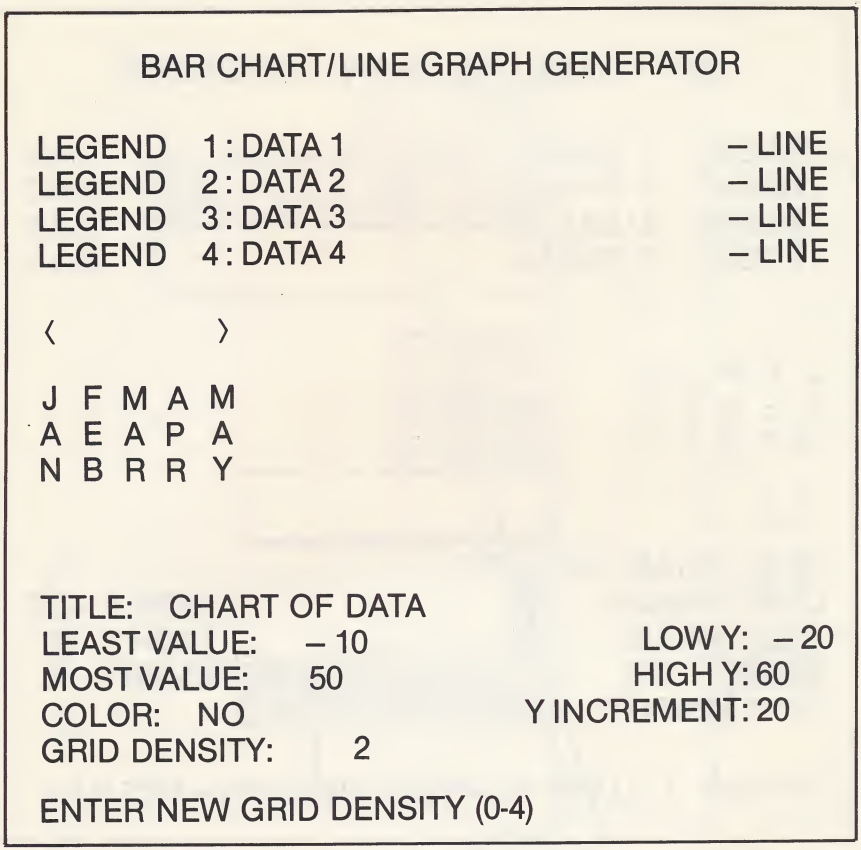

BAR CHART/LINE GRAPH GENERATOR
LEGEND 1 : DATA 1 – LINE
LEGEND 2 : DATA 2 – LINE
LEGEND 3 : DATA 3 – LINE
LEGEND 4 : DATA 4 – LINE
〈 〉
J F M A M
A E A P A
N B R R Y
TITLE: CHART OF DATA
LEAST VALUE: – 10
LOW Y: – 20
MOST VALUE: 50
HIGH Y: 60
COLOR: NO
Y INCREMENT: 20
GRID DENSITY: 2
ENTER NEW GRID DENSITY (0-4)

FIGURE 5

We must now select the format for each set of data. We may choose between bars or lines for each data set. The default value is "LINE," which is located across from the legends. To change the format for each data set, enter a "L." To select a bar for DATA 1 enter a "B." We wish DATA 2 to be plotted with a line so enter a CR. Enter a "B" for both DATA 3 and DATA 4. After entering B,CR,B,B the screen should display the information shown in Figure 6. The "NONE" option, if used, will prevent the data from being plotted.

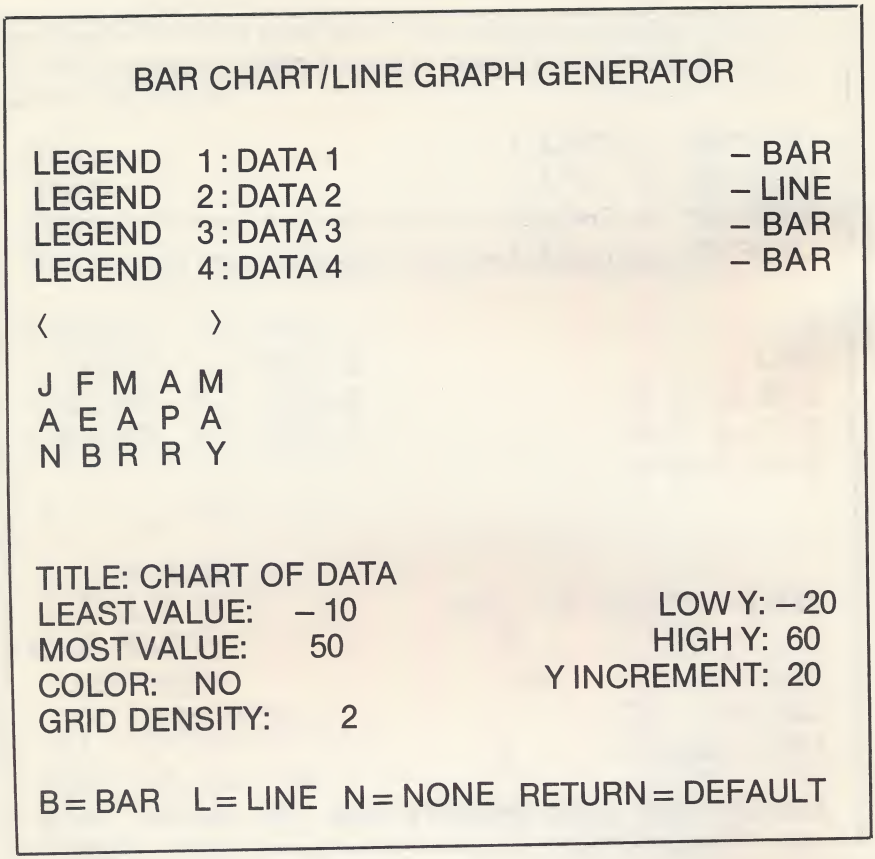

BAR CHART/LINE GRAPH GENERATOR
LEGEND 1 : DATA 1
LEGEND 2 : DATA 2
LEGEND 3 : DATA 3
LEGEND 4 : DATA 4
– BAR
– LINE
– BAR
– BAR
⟨ ⟩
J F M A M
A E A P A
N B R R Y
TITLE: CHART OF DATA
LEAST VALUE: – 10
MOST VALUE: 50
COLOR: NO
GRID DENSITY: 2
LOW Y: – 20
HIGH Y: 60
Y INCREMENT: 20
B = BAR L = LINE N = NONE RETURN = DEFAULT

FIGURE 6

We have now selected all of the bar chart/line graph parameters that we need to create the following bar chart/line graph. We plot the bar chart by entering a CTRL-P. If you wish to redefine some of the parameters after the bar chart is plotted select the "redefine new parameter" option in the menu displayed after the bar chart is displayed. You may always go back and redefine new parameters after the chart is plotted without having to re-enter the data.

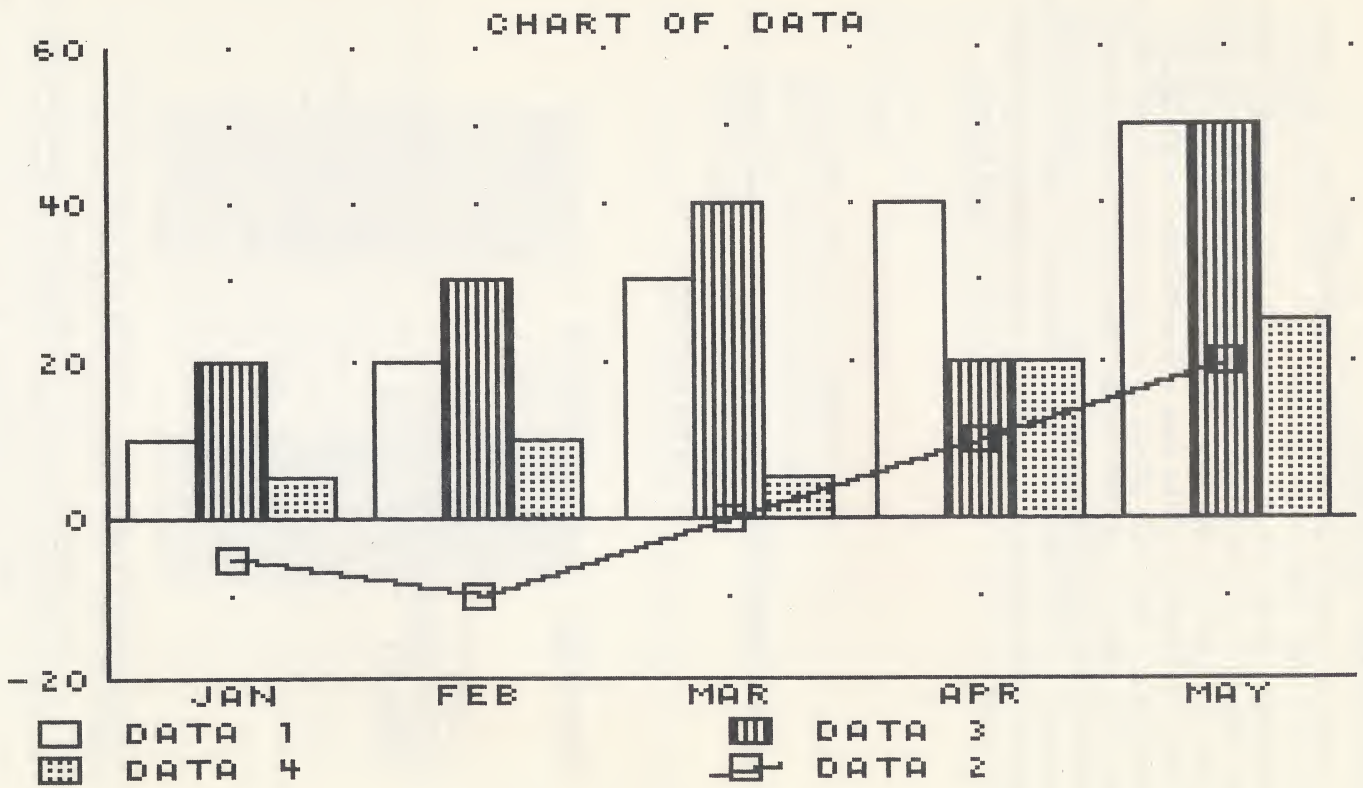


CHART OF DATA
60
40
20
0
-20
JAN
FEB
MAR
APR
MAY
DATA 1
DATA 3
DATA 4
DATA 2

A PIE CHART TUTORIAL

To create a pie chart, we must enter data through the data editor. For sake of brevity, please read the Bar Chart/Line Graph tutorial to familiarize yourself with the Business Graphics data editor. Select the data editor from the Business Graphics menu and enter the data as shown in Figure 7. In this example, we are extending the x-field entries into column 2 of the data editor. We may do this when creating a pie chart. This allows us to have labels up to 16 characters long. The numerical data for the pie chart must then be entered in column 3. After entering the data shown in Figure 7, return to the Business Graphics menu and select the pie chart option. The screen displayed after selecting the pie chart option is shown in Figure 8. The values at the right of the screen are the default values.

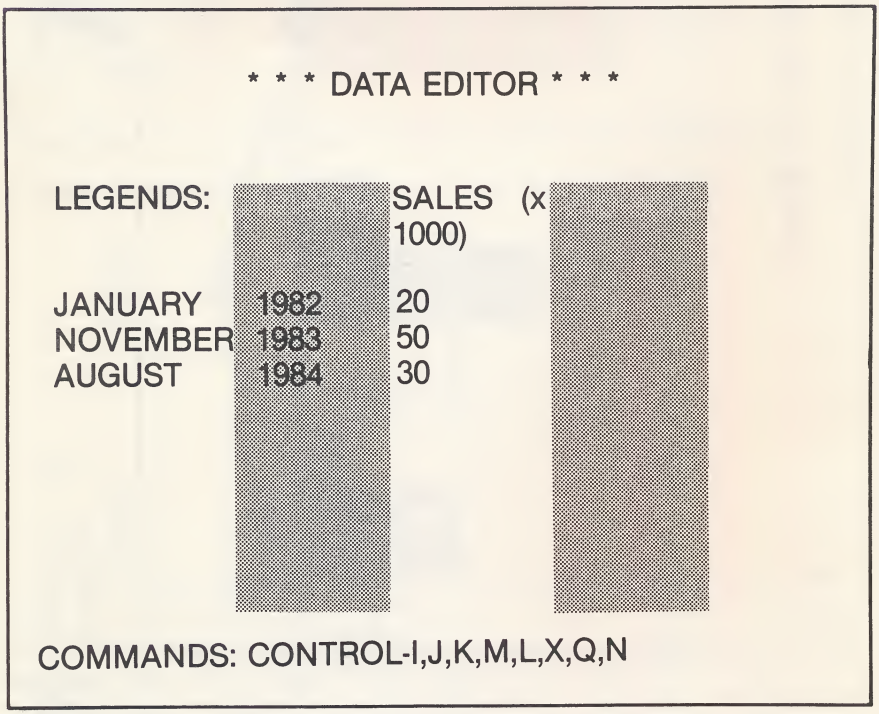


FIGURE 7

PIE CHART GENERATOR

LEGEND 1:
LEGEND 2: SALES (X1000)
LEGEND 3:
LEGEND 4:

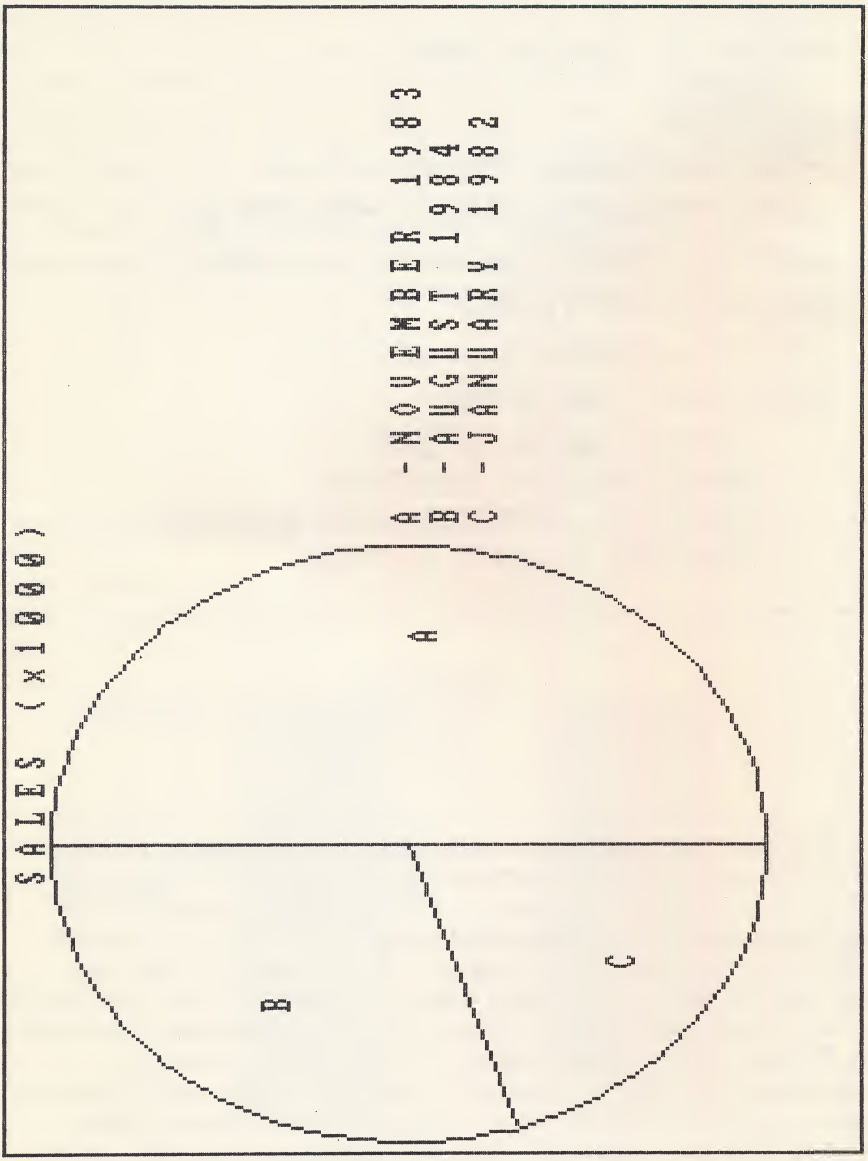
HOW MANY LABEL FIELDS (1 OR 2)?	1
CHART WHICH COLUMN (1 THROUGH 4?)	1
SORT: 0 = DON'T: 1 = VALUES; 2 = LABELS:	1
COLOR: 0 = NO; 1 = YES:	1
STYLE: 0 = SIDEWAYS; 1 = UPRIGHT:	0

ROTATION: – 180 TO 180:

ARROWS MOVE CURSOR
SPACE SELECTS QUESTION
CONTROL – P PROCESSES PIE CHART
CONTROL – QUITS TO MENU

FIGURE 8

To create a pie chart, we simply select the parameters we desire. The first parameter is the number of label fields. We must change this to 2 since our x-field labels are longer than 8 characters. The next parameter determines which column of data is to be plotted. This parameter should be changed to 2. The numerical data was placed in column 3 of the data editor, but we do not consider the first column because it is the x-field column. Thus, the data is in column 2. The sort parameter will organize the pie slices. Leave this parameter at 1. This will create the largest slice first, sorting slices by size. If you desire the pie to be created as the data was entered, change this parameter to 0. Since we are going to print this pie we will use a black and white pie. Change the color option to 0. We will leave the style and rotation parameters at the default values. These are all the necessary parameter changes necessary to create the pie chart below. You may vary the parameters to create the pie of your choice. To process the pie chart enter a CTRL-P.


SALES (x10000)
A - NOVEMBER 1983
B - AUGUST 1984
C - JANUARY 1982
A
B
C